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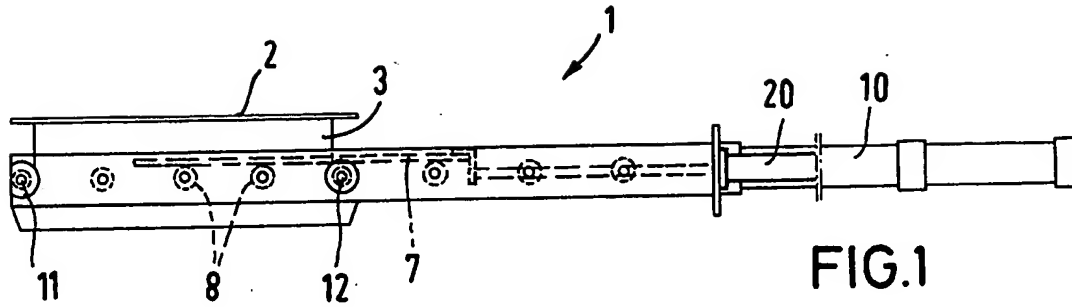


FIG.1

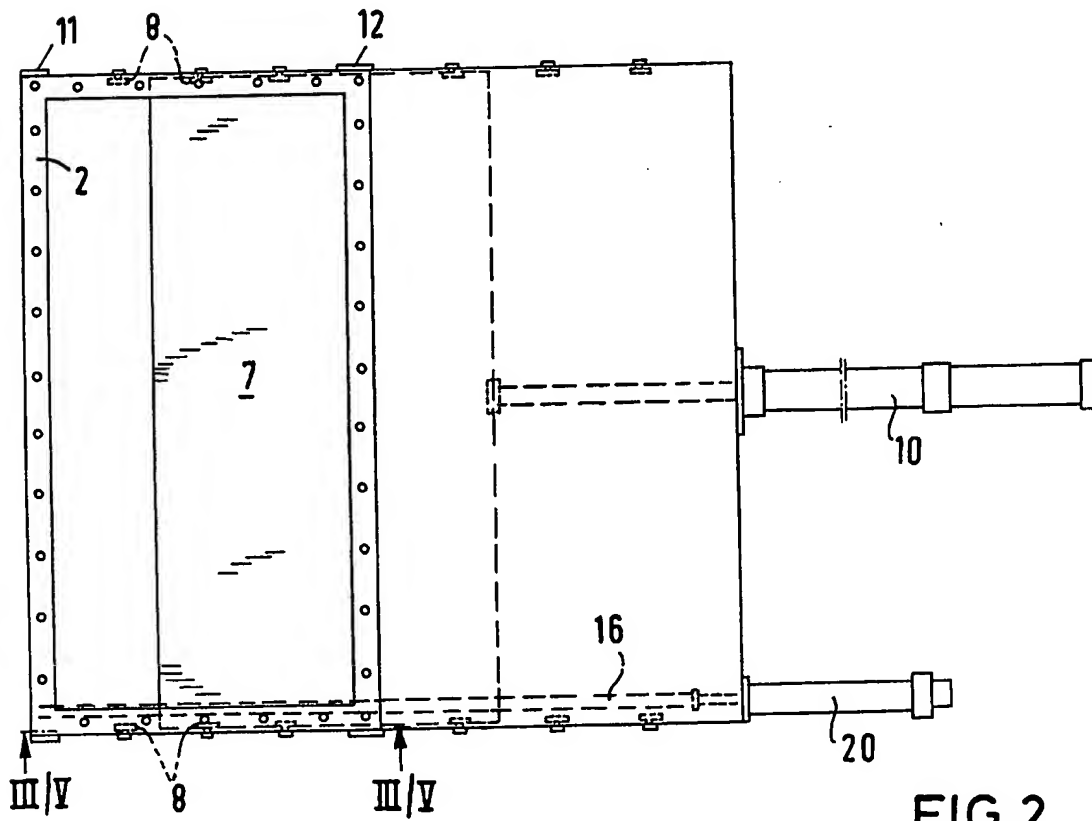
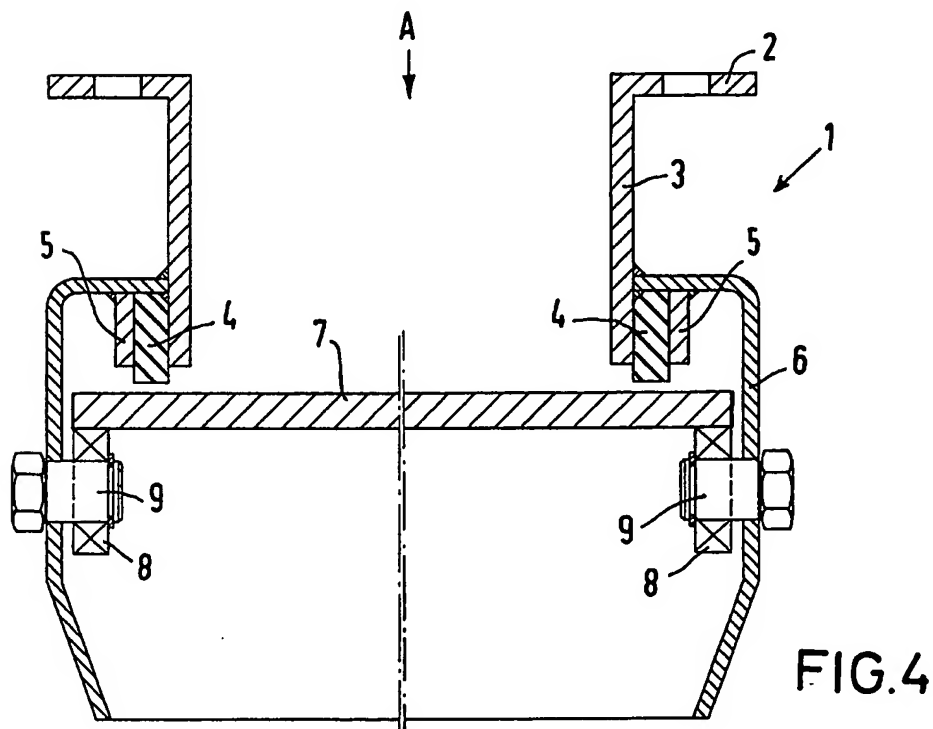
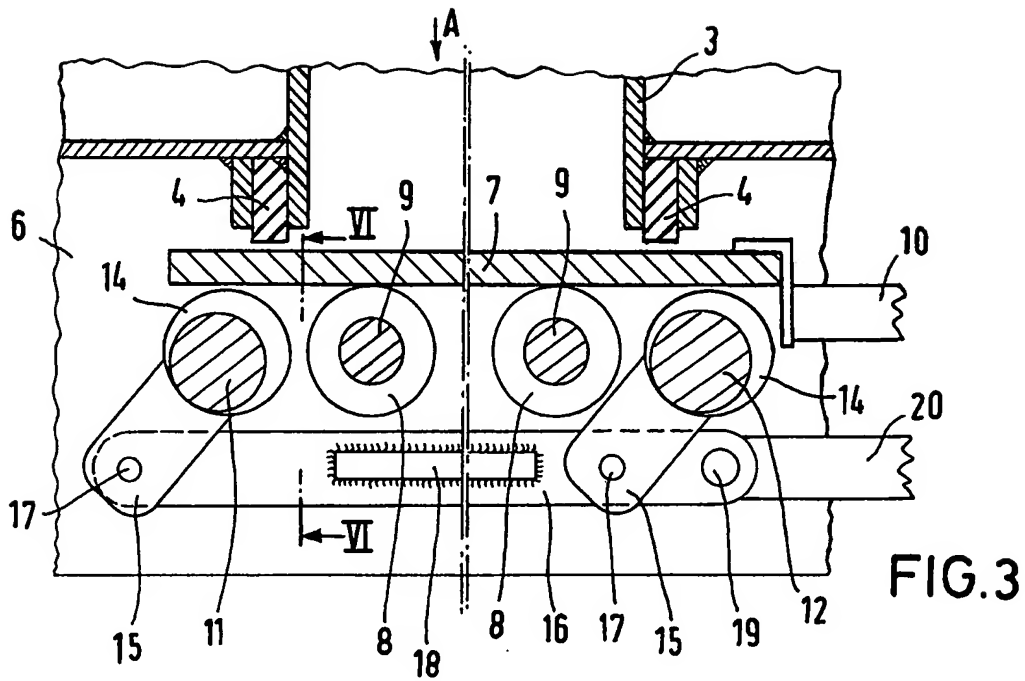
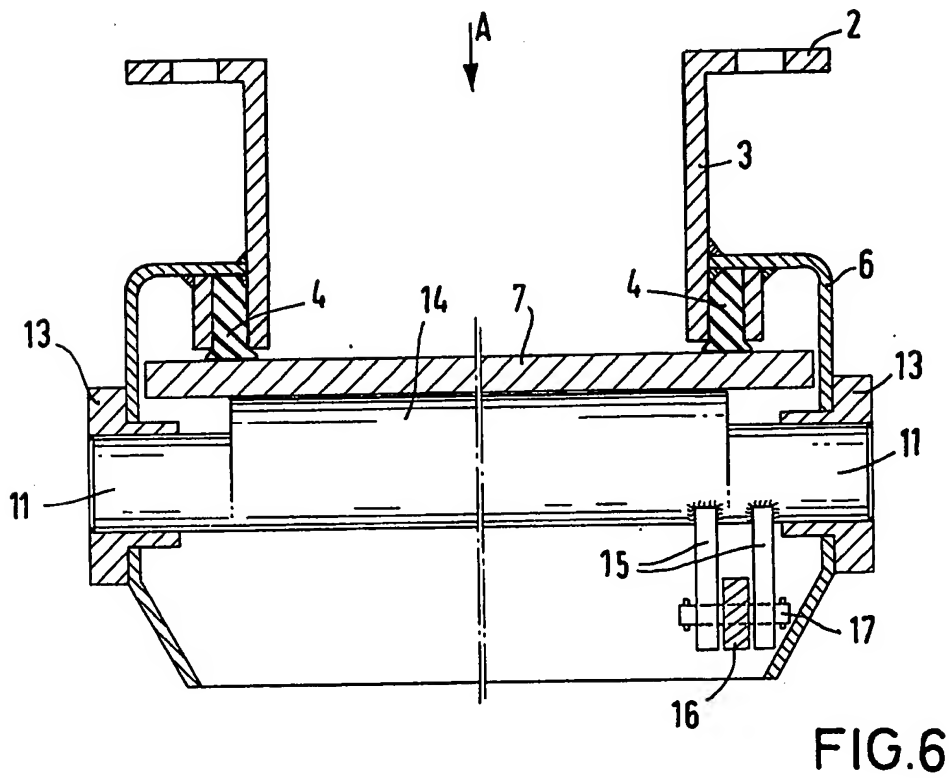
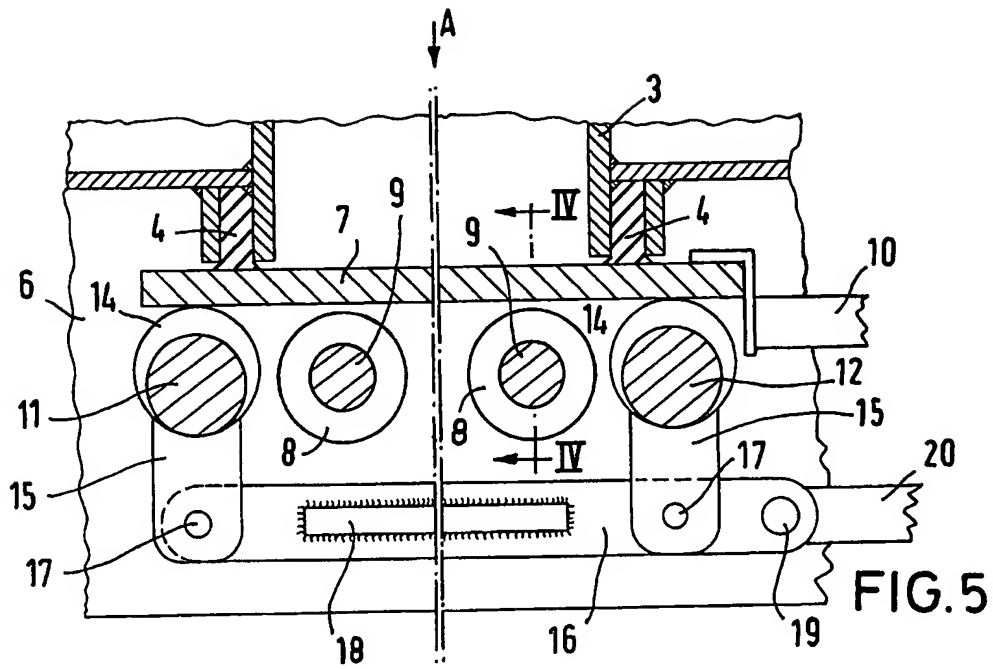


FIG.2

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## SPECIFICATION

### Closure valve for the outlet aperture of a container

5 The present invention relates to closure valve for the outlet aperture of a container for loose material, the valve including a valve plate, which is slidable within a housing along a guide, and which can be urged against a gasket running around the outlet aperture by means of a cam device adjacent to the valve plate in the area of the periphery of the outlet aperture.

A valve of this kind is described in German Patent No. 932 599, where the cam device consists of a single locking cam, arranged centrally below the valve plate, with eccentric pivotal mounting on a sliding support, which can be moved horizontally on tracks.

A connecting rod leading outside, which also forms the axis of rotation of the locking cam, serves not only for the actuation of the locking cam, but also for the movement along the sliding guide of the unit consisting of a sliding support, the valve plate and the locking cam. The mounting and control of the valve plate are not reliable in operation on the sliding support because of flexible connections, both during the movement of the sliding support carrying the valve plate, and during the actuation of the locking cam. In addition to this tilting of the valve plate during the pressure against the outlet orifice cannot reliably be prevented, and the single locking cam does not guarantee a completely tight position of the valve plate against the gasket. The valve plate cannot stop in an intermediate position to decrease the size of the opening of the outlet aperture, because falling loose material would damage the flexible mounting of the valve plate on the sliding support, and raising and pressing of the valve plate can only be effected when the valve plate is in its final position below the outlet aperture. The tracks for the sliding support can quickly become obstructed with falling material and inhibit the sliding movement.

Another slide for closing the outlet aperture of a container for loose materials is described in German Auslegeschrift No. 1,781,411. In this case, too, the valve plate is brought into the closed position by means of a cam device. A horizontal row of single eccentric cams actuated by means of a hand lever, is mounted in a rotatable manner on each of the opposite sides below the outlet aperture, the upper surfaces of which eccentric cams, when they are in the lowered position, form the sliding guide for the valve plate; in their raised position the eccentric cams press the valve plate against the gasket. In this case, two rows of single cams are provided, which effect a more even disposition of the valve plate against the outlet aperture than a single eccentric cam acting upon the centre of the plate. However, by his method as well, only pointwise support of the valve plate is obtained in the closing position, and thus there is a danger of leaks if the valve plate distorts. The operation of this valve is complicated, because the eccentric cams of each row must be actuated individually by means of hand levers. In addition to this, individual actuation can mean that

particular eccentric cams are not brought into their final closed position, so that the pressure effect on the valve plate is uneven. A further disadvantage with this arrangement is that the eccentric cams form the sliding guide for the valve plate, which subjects them to a higher degree of wear, and wears away their cam surfaces prematurely, so that the force of their pressure is reduced. This problem must be prevented by making the valve plate thin and light, and only using it with light loose material. In view of the manual operation of the single eccentric cams, it is also important to have as little weight as possible bearing on the eccentric cams. Thus the known valve can only be used with small containers and prescribed loose materials, and its range of application is limited.

A further valve is known, in accordance with German Offenlegungsschrift No. 2,650,677, where the valve plate is fixed onto a movable frame by means of cover plates. Immediately prior to the abutment of the valve plate against a stop plate at the end of the entry movement, the cover plates rise up from their sloping normal position and lift the valve plate into the closed position. With this valve, several moving parts work together, the mobility of which can be impaired by falling material, which disrupts the sliding motion. The expensive construction is made even more expensive by the fact that the components must be very strong so that they do not distort when the valve plate exerts high pressure against the support. Whether a completely tight arrangement of the valve plate around the sealing rims of the outlet orifice can be achieved by this device is doubtful, because the valve plate is only support pointwise on the cover plates, and play induced by the wear of the moving parts cannot be compensated for by this support.

According to the present invention there is provided a closure valve for the outlet aperture of a container for loose material, which closure valve comprises:

a housing extending around the outlet aperture of the container, the housing incorporating a gasket which extends around said outlet aperture;  
a valve plate which is slidable within a guide provided in the housing; and  
a cam device mounted in the housing adjacent to a peripheral edge of the outlet aperture, the cam device being located on that side of the valve plate opposite to the gasket, the cam of the cam device extending adjacent to the valve plate over substantially the entire length of the associated peripheral edge of the outlet aperture.

Thus the valve plate is pressed against the gasket of the housing in a continuous uninterrupted line substantially over the length of the associated peripheral area of the outlet aperture, so that a gas- and water-tight seal is produced at the outlet aperture. A single actuator suffices for the movement of the cam which is of a length suitable to the outlet aperture. The construction is simple and robust, and because of the small number of movable parts, it will work over a long period practically maintenance-free. The long cam not only clamps the valve plate tightly in the final closed position, but